Update on comparison between BeAGLE and E665

Wan Chang

2020.07.02

Update vs. old

old:

if charge>1

Four vector in lab frame: $(\frac{p_x}{charge}, \frac{p_y}{charge}, \frac{p_z}{charge}, \sqrt{\frac{p_x^2}{charge^2} + \frac{p_y^2}{charge^2} + \frac{p_z^2}{charge^2} + m_p^2})$

do boost → four vector in cms frame $(p_x^*, p_y^*, p_z^*, E_p^*)$

if 0<charge<= 1

Assume four vector in lab frame: $(p_x, p_y, p_z, \sqrt{p_x^2 + p_y^2 + p_z^2 + m_\pi^2})$

do boost → four vector in cms frame $(p_x^*, p_y^*, p_z^*, E_\pi^*)$

if $x_F = \frac{2p_z^*}{W} > -0.2$, $(p_x^*, p_y^*, p_z^*, E_\pi^*)$

if $x_F = \frac{2p_z^*}{W} < -0.2$, four vector in lab frame: $(p_x, p_y, p_z, \sqrt{p_x^2 + p_y^2 + p_z^2 + m_p^2})$

do boost → $(p_x^*, p_y^*, p_z^*, E_p^*)$

Update:

if charge>0

Assume four vector in lab frame: $(\frac{p_x}{charge}, \frac{p_y}{charge}, \frac{p_z}{charge}, \sqrt{\frac{p_x^2}{charge^2} + \frac{p_y^2}{charge^2} + \frac{p_z^2}{charge^2} + m_\pi^2})$

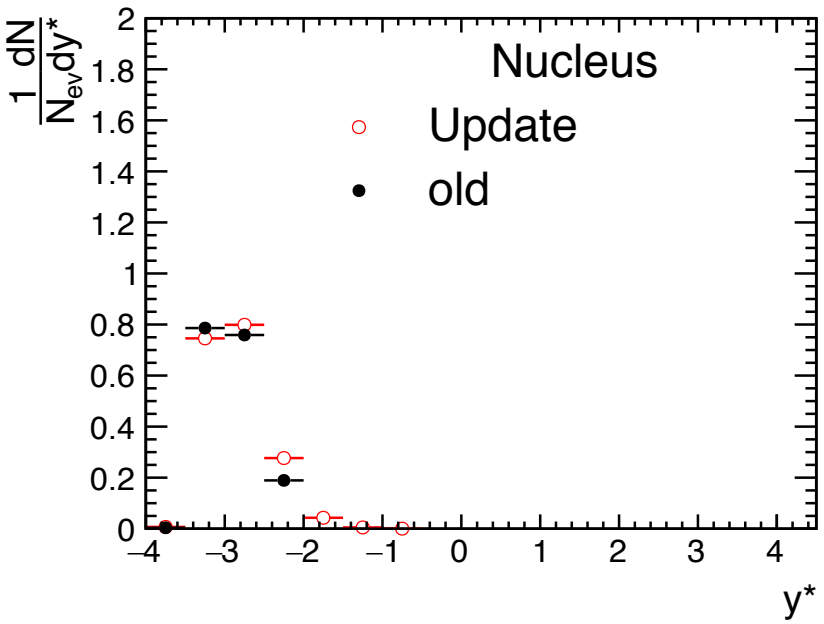
do boost → four vector in cms frame $(p_x^*, p_y^*, p_z^*, E_\pi^*)$

if $x_F = \frac{2p_z^*}{W} > -0.2$, $(p_x^*, p_y^*, p_z^*, E_\pi^*)$

if $x_F = \frac{2p_z^*}{W} < -0.2$, four vector in lab frame: $(p_x, p_y, p_z, \sqrt{p_x^2 + p_y^2 + p_z^2 + m_p^2})$

do boost $(p_x^*, p_y^*, p_z^*, E_p^*)$

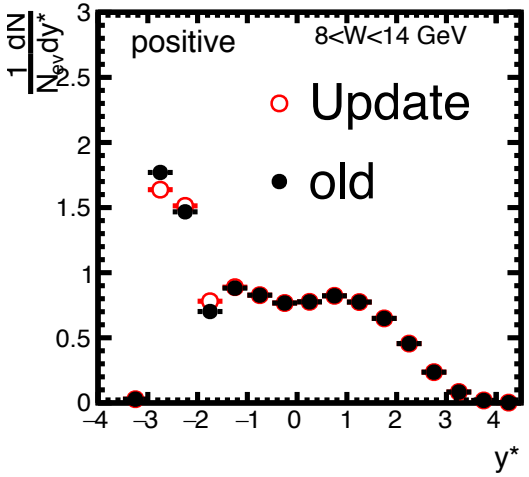
y* distribution for Nucleus:

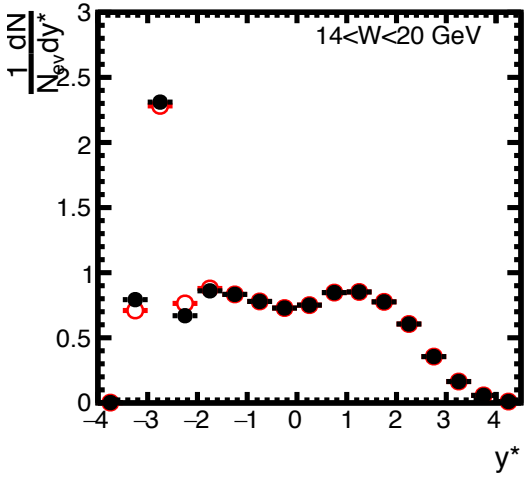


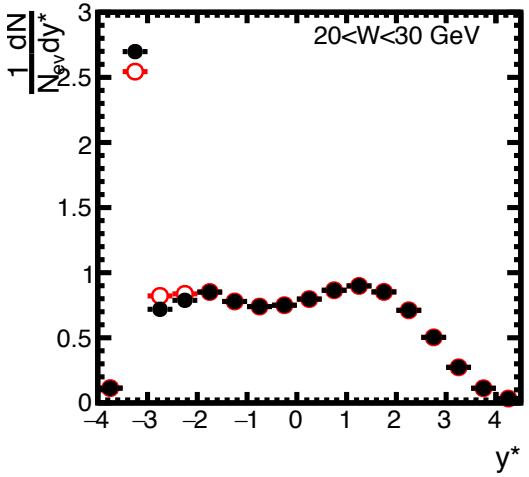
Update vs. old

Normalized cms-rapidity distribution of negative and positive hadrons, for muXe scattering, in three bins of W.

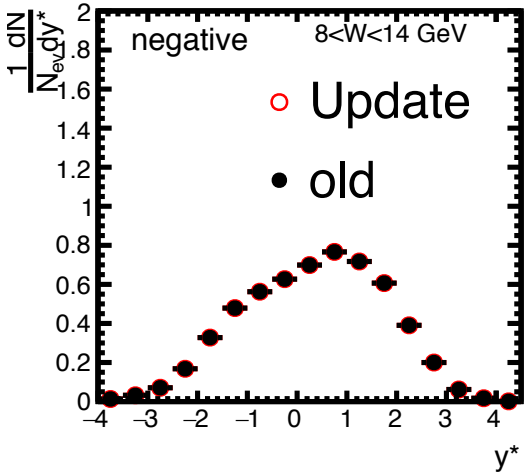
Positive

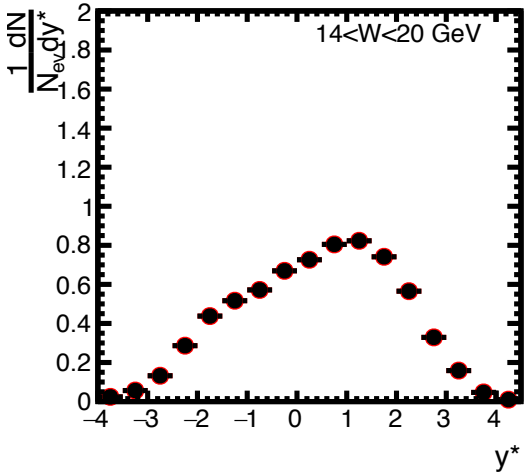


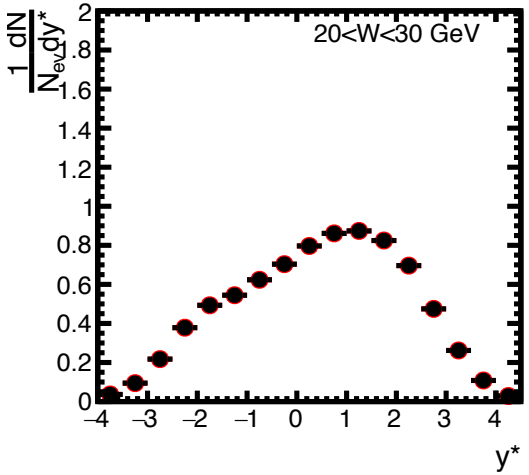




Negative







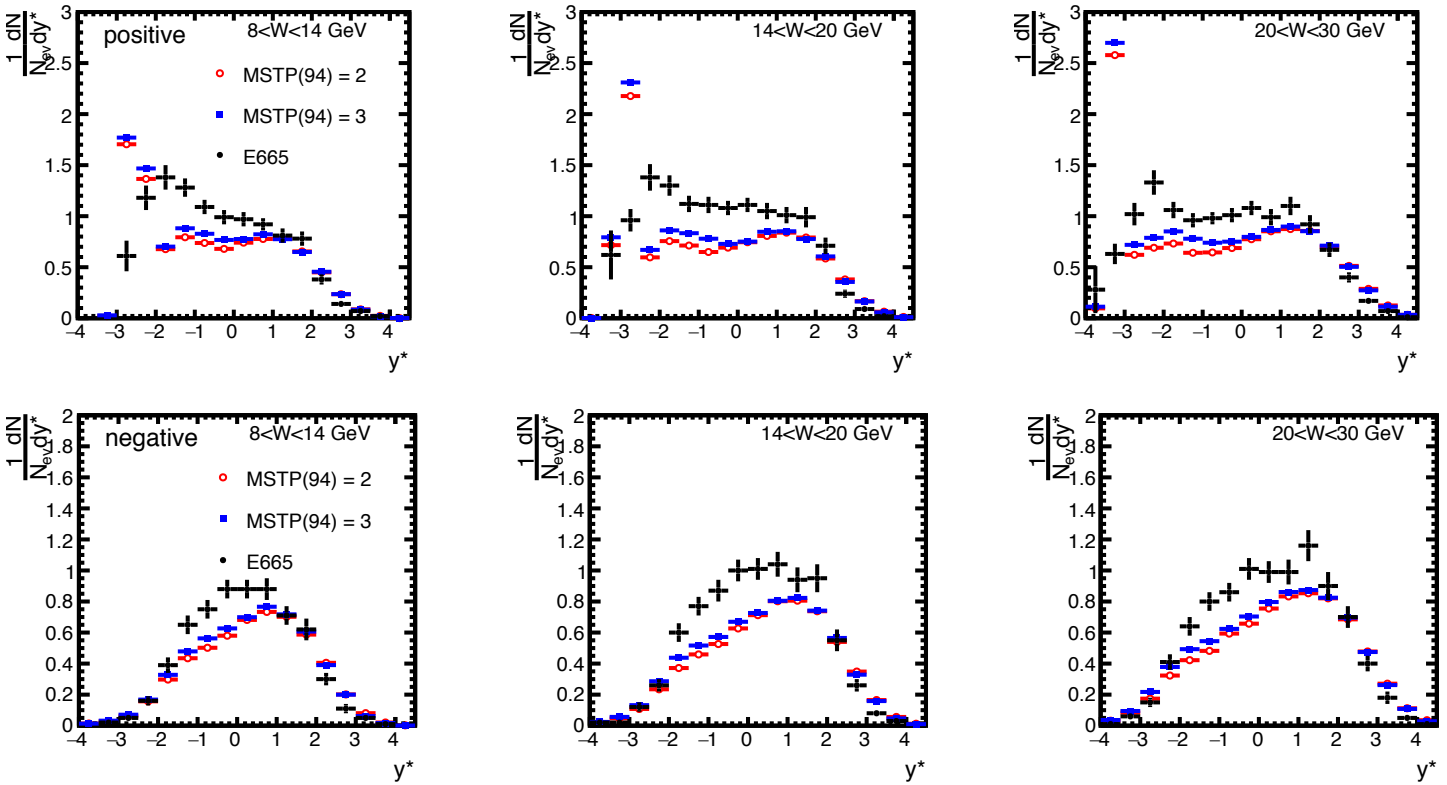
MSTP(94) = 2 vs. 3

Tau0 = 5 fm

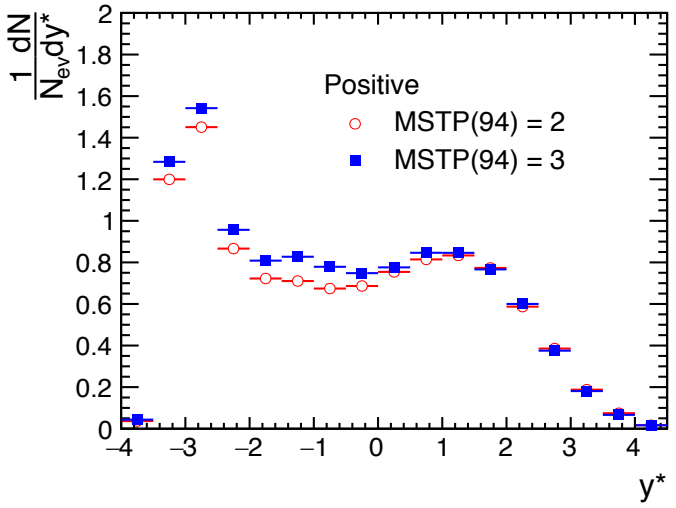
MSTP(94) = 2 & PARP(91)=PARP(99)=PARJ(21)=0.4 & PARJ(170)=0.2

MSTP(94) = 3 & PARP(91)=PARP(99)=PARJ(21)=0.4=PARJ(170)=0.4

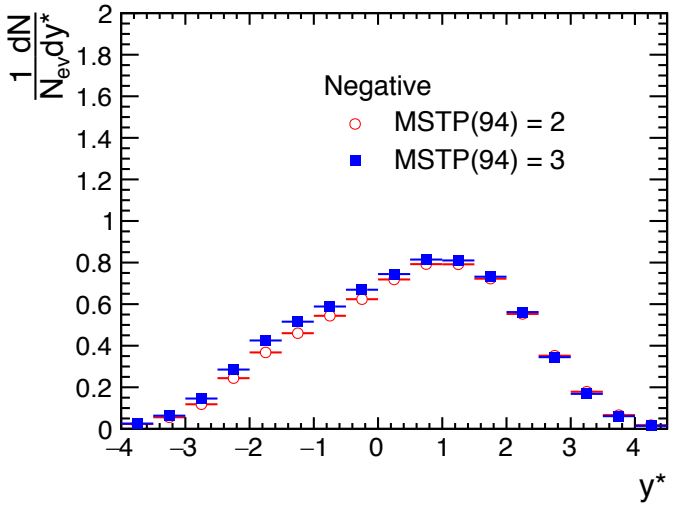
Normalized cms-rapidity distribution of positive and negative hadrons, for muXe scattering, in three bins of W:



y* distribution for all positive hadrons :

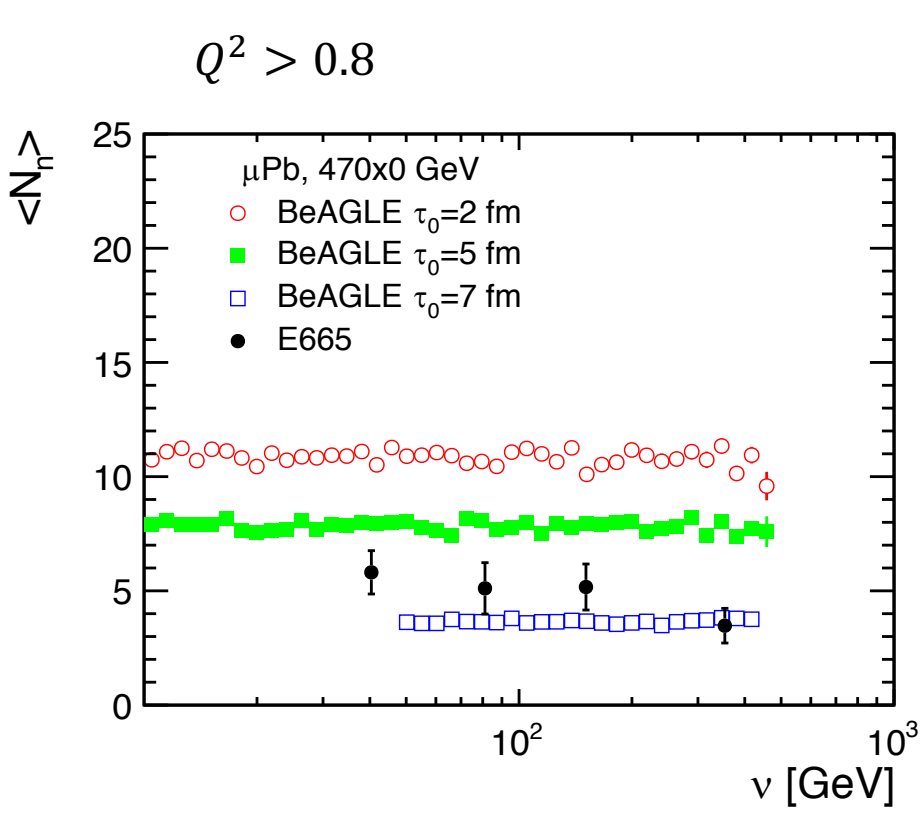


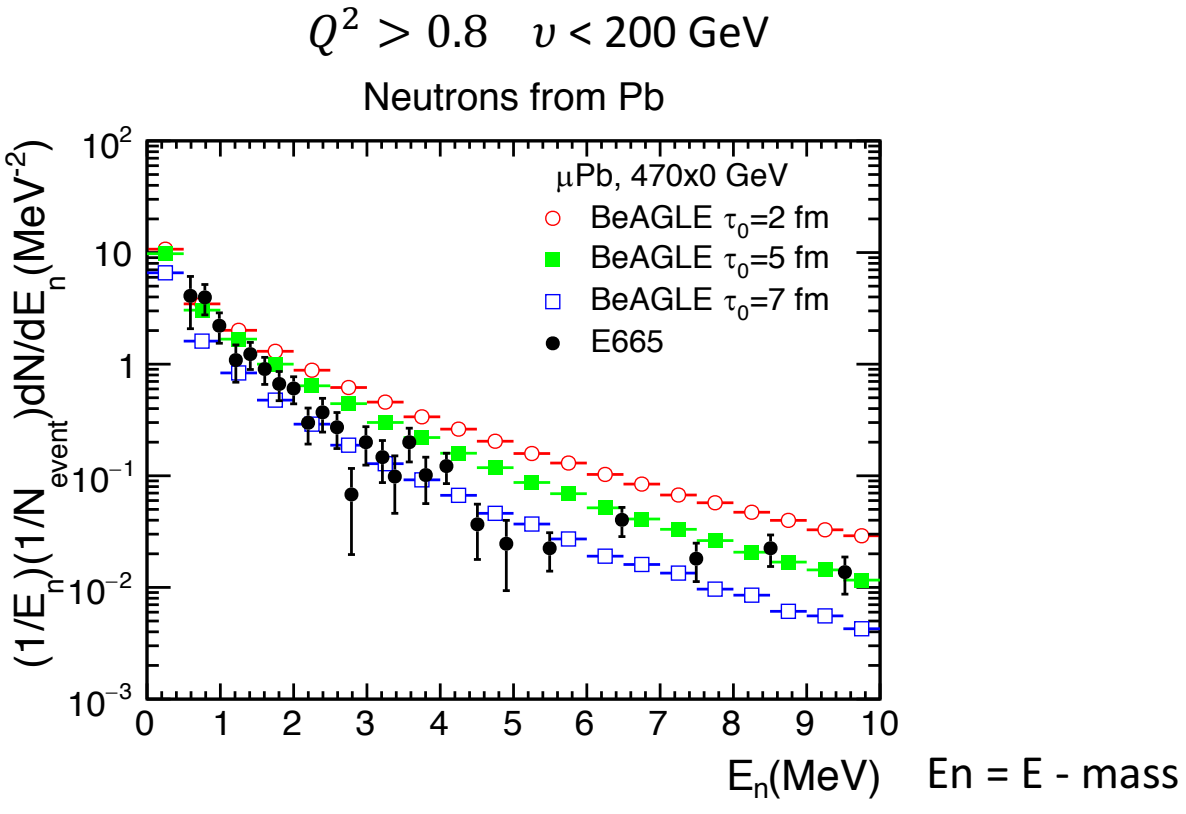
y* distribution for all negative hadrons :



Neutron number vs. nu

Results of different formation length parameters as a function of nu and En in the simulation compared with the E665 data:
M. Adams et al. (E665 Collaboration), Phys.Rev.Lett. 74, 5198 (1995)





En = E - mass

The results with $\tau_0 = 7$ fm are mostly close to the E665 result.

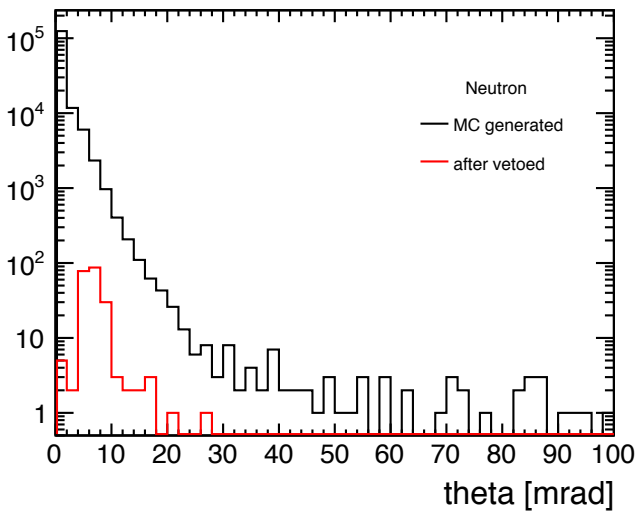
Vetoing of incoherent

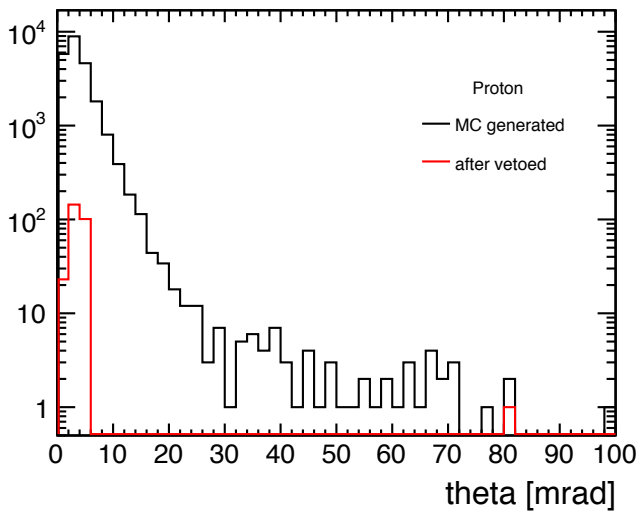
- $e + Pb \rightarrow e' + J/\psi + X(p, n, \gamma)$
- 18x110 GeV
- 40k events

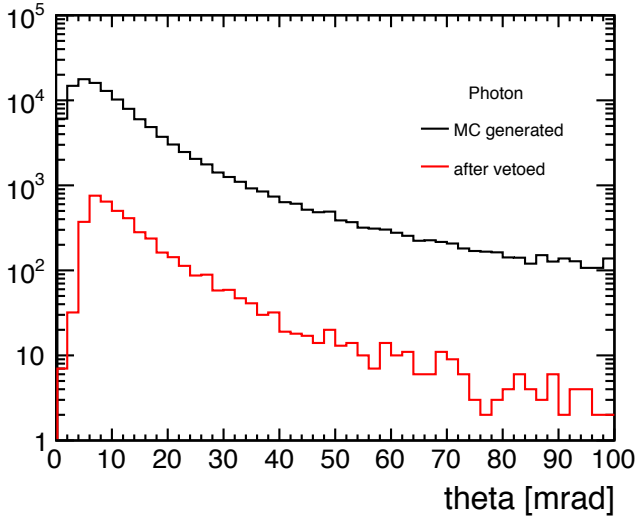
Data sample:

- /gpfs/mnt/gpfs02/eic/mdbaker/eA-BeAGLE/ePb_18x110_Q2_1_10_y_0.01_0.95_tau_7_noquench_kt=ptfrag=0.32_Shd3_ShdFac=1.32_Jpsidiffnodecay_fixpfUS3_seqnp_40k.*.root

The theta distribution of protons, neutrons and photons before and after vetoed:

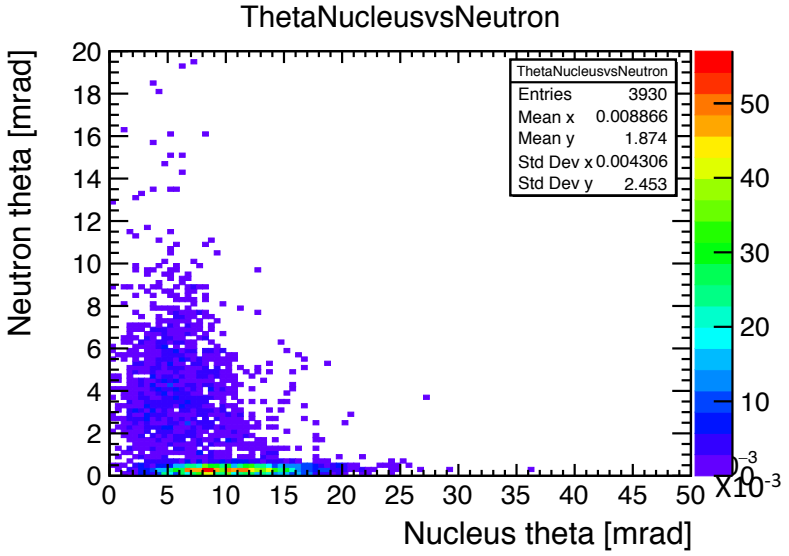




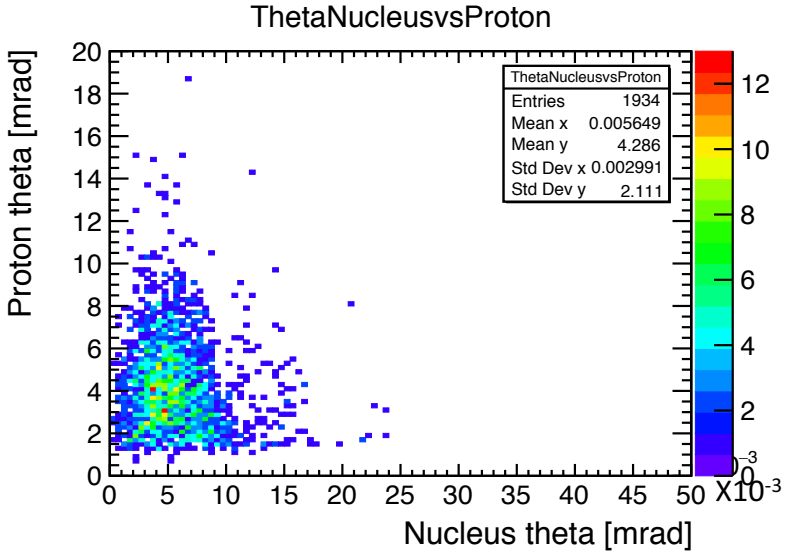


if there is a nucleus with A-1 and Z or A-1 and Z-1 plot the correlation of the theta of the nucleus and the theta of either the proton and neutron:

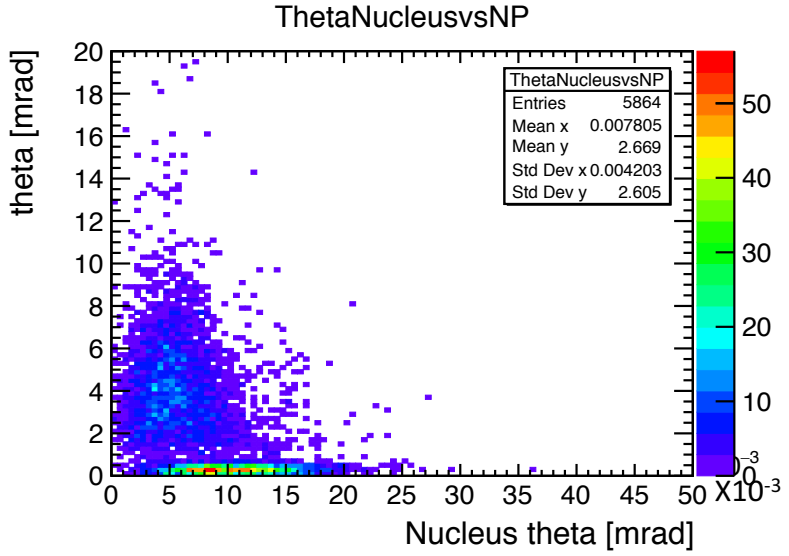
The correlation of theta of the nucleus with A-1 and Z and the theta of neutron:



The correlation of theta of the nucleus with A-1 and Z-1 and the theta of proton:

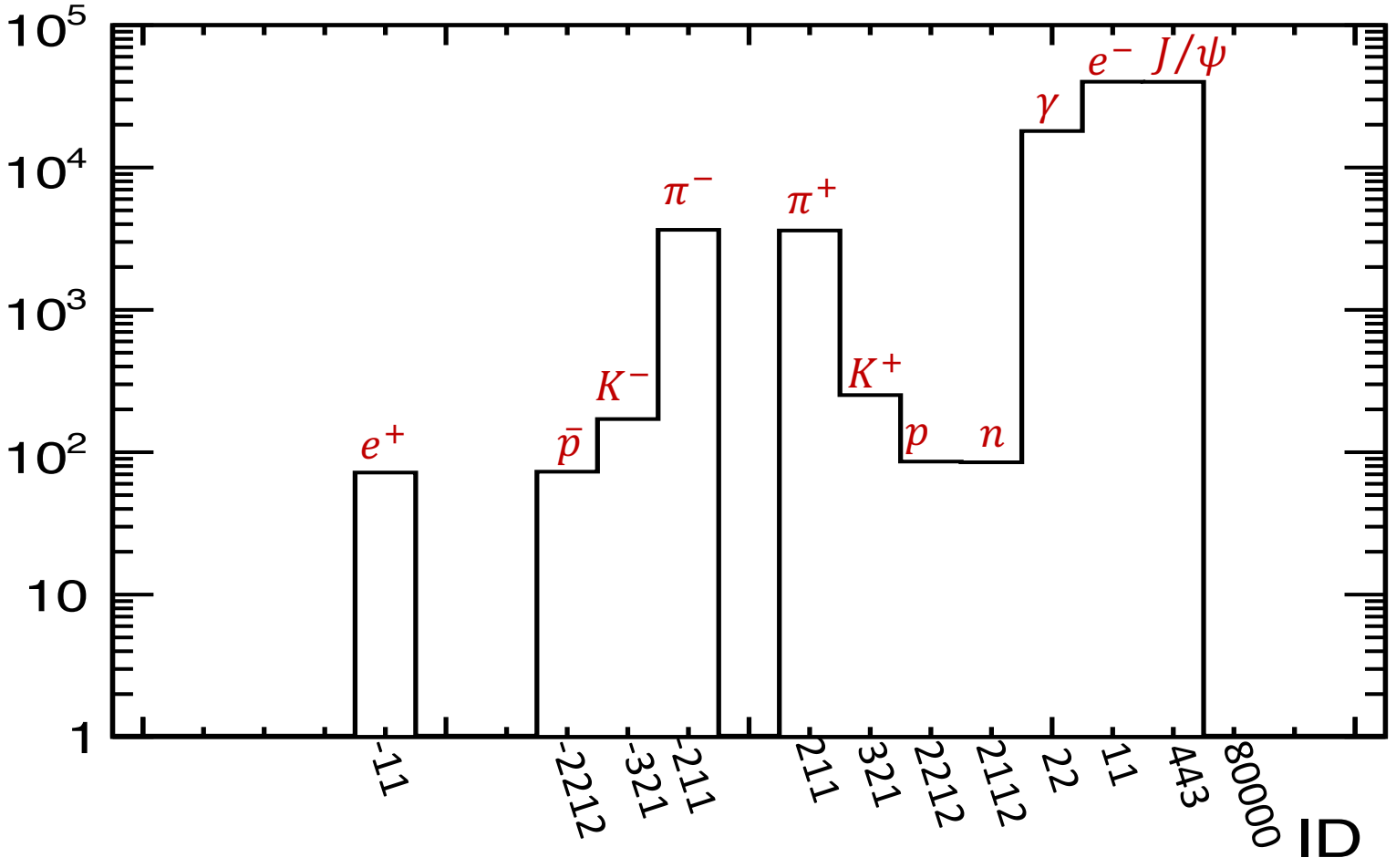


if there is a nucleus with A-1 and Z or A-1 and Z-1 plot the correlation of the theta of the nucleus and the theta of either the proton and neutron:



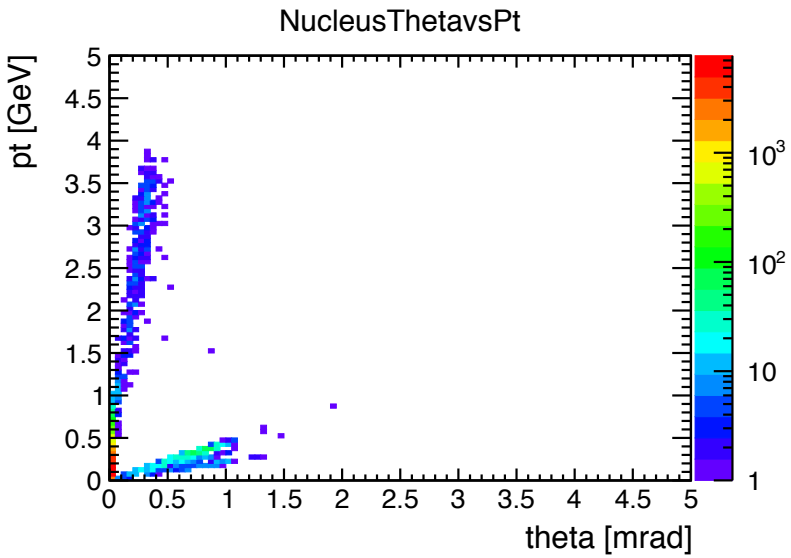
Backup

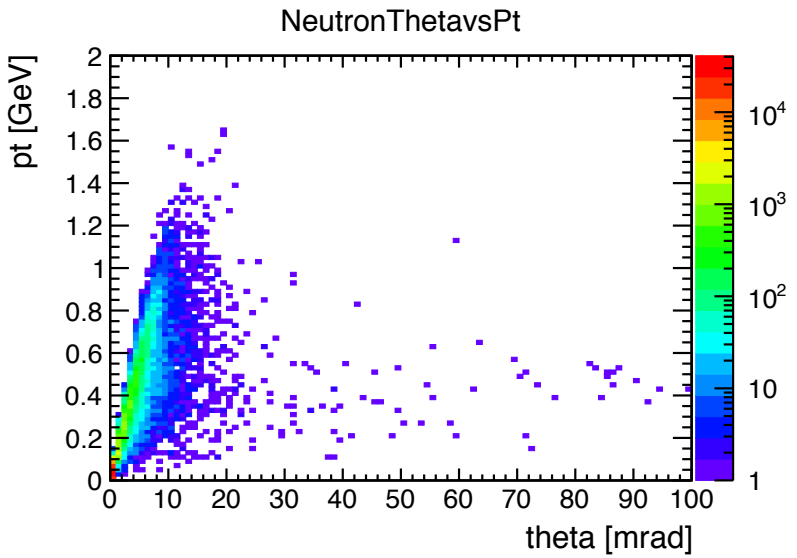
Particle ID of all particles which have theta>30mrad:

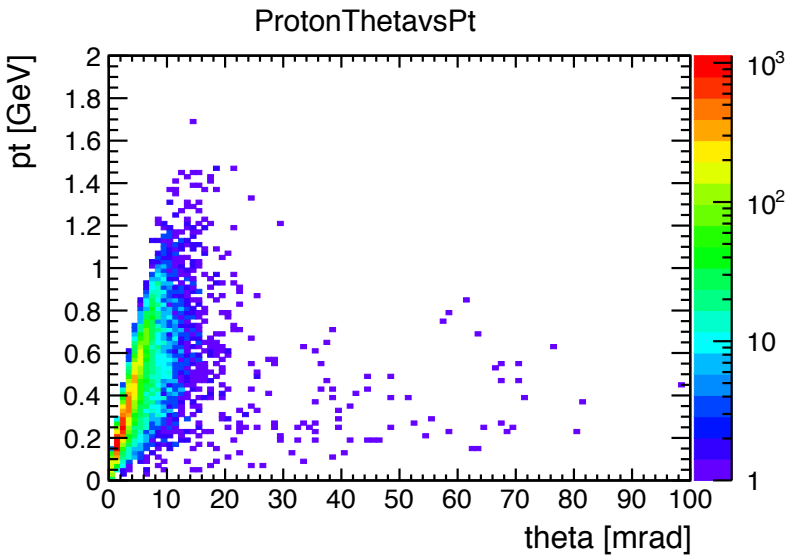


These are the particles which go into the main detector.

Theta vs. pt (MC generated)







Theta vs. pt (MC generated)